

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
11 March 2004 (11.03.2004)

PCT

(10) International Publication Number  
**WO 2004/020340 A3**

(51) International Patent Classification<sup>7</sup>: **B01D 17/12**,  
F17D 3/00

[US/US]; 13205 Stoney Springs Drive, Chardon, OH  
44024 (US).

(21) International Application Number:  
PCT/US2003/026456

(74) Agent: **HLAVKA, John, R.**; Watts Hoffmann Co., L.P.A.,  
P.O. Box 99839, Cleveland, OH 44199-0839 (US).

(22) International Filing Date: 22 August 2003 (22.08.2003)

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,  
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,  
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/406,545 28 August 2002 (28.08.2002) US

(71) Applicant (*for all designated States except US*): **KI-  
NETICO INCORPORATED** [US/US]; 10845 Kinsman  
Road, Newbury, OH 44065 (US).

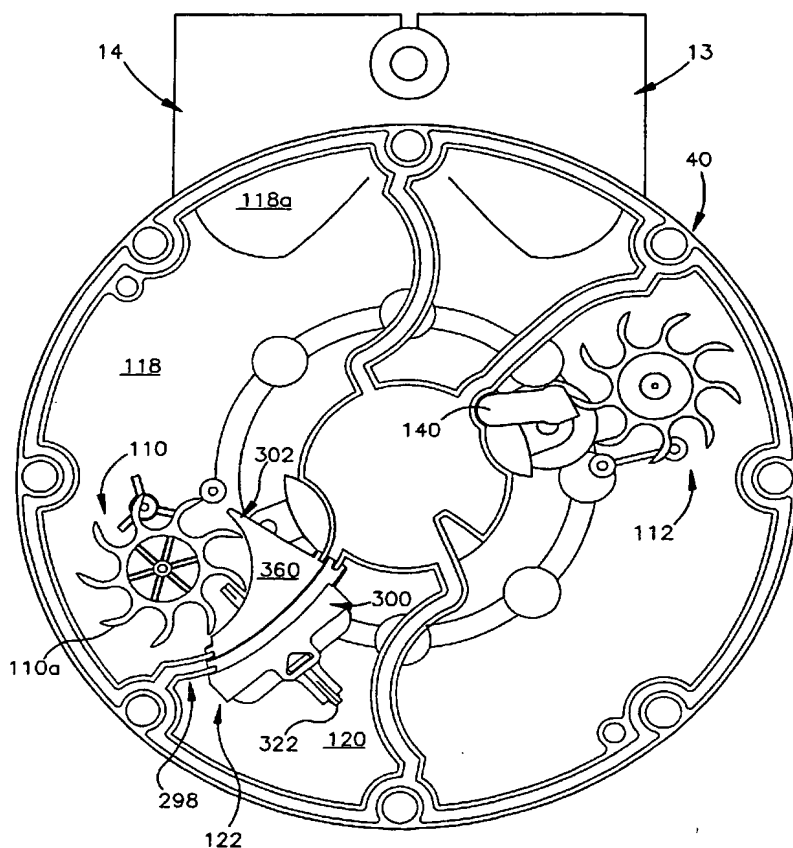
(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **PARK, Stuart**

[Continued on next page]

(54) Title: FLUID TREATMENT SYSTEM



(57) Abstract: A control valve for a water treatment system which includes a turbine (110) rotatably mounted within a water receiving chamber. A nozzle assembly (122) defines first and second fluid paths, one of the flow paths may include a fluid pressure response valve element (320) for controlling fluid flow along the one path. The system also comprises a nozzle assembly (122') defining a throat (302') extending from an inlet and terminating in an arcuate outlet conforming to the periphery of the turbine. A plurality of spaced apart and angled vanes (404) are disposed in the throat.

WO 2004/020340 A3

WO 20020340 A3



SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:  
1 July 2004

**Published:**

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

International Publication No.

PCT/US03/26456

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B01D 17/12; F17D 3/00

US CL : 137/624.18, 624.14; 210/98, 190

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 137/624.18, 624.14; 210/98, 190, 88, 264

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,375,768 A (CLARK) 27 December 1994 (27.12.1994), column 3, lines 7-64.	1-5, 7 and 10
A	US 5,490,932 A (HANSEN et al) 13 February 1996 (13.02.1996), col. 6, lines 16-55.	13, 22 and 23

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

04 March 2004 (04.03.2004)

Date of mailing of the international search report

12 APR 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Authorized officer

KEVIN H. LEE

Telephone No. (703) 308-0861